Name: Date:

Polynomial Factoring solution (version 679)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2-4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 - 4x + 31 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(-4) \pm \sqrt{(-4)^2 - 4(1)(31)}}{2(1)}$$

$$x = \frac{-(-4) \pm \sqrt{16 - 124}}{2(1)}$$

$$x = \frac{4 \pm \sqrt{-108}}{2}$$

$$x = \frac{4 \pm \sqrt{-36 \cdot 3}}{2}$$

$$x = \frac{4 \pm 6\sqrt{3}\, i}{2}$$

$$x = 2 \pm 3\sqrt{3}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $-9 + 4i$ and $-6 + 2i$ in standard form $(a + bi)$.**

Solution

$$(-9 + 4i) \cdot (-6 + 2i)$$

$$54 - 18i - 24i + 8i^2$$

$$54 - 18i - 24i - 8$$

$$54 - 8 - 18i - 24i$$

$$46 - 42i$$

Polynomial Factoring solution (version 679)

3. **Write function $f(x) = x^3 - 10x^2 + 29x - 20$ in factored form. I'll give you a hint: one factor is $(x - 1)$.**

Solution

	1	-10	29	-20
1		1	-9	20
	1	-9	20	0

$$f(x) = (x-1)(x^2 - 9x + 20)$$

$$f(x) = (x-1)(x-4)(x-5)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = -(x+3) \cdot (x-2)^2 \cdot (x-5)$$

Sketch a graph of polynomial $y = p(x)$.